## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10-22-2009 has been entered.

The amendment filed on 10-22-2009 is acknowledged. Claim 1 has been amended. Claims 7-8 have been canceled. Claims 1, 3-6, 9, 21-22 and 25-27 are pending and currently under examination.

### *Claim Rejections Withdrawn*

The rejection of claims 1, 3-9, 22 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Menzel et al. (U.S. Patent 5,521,066) in view of Georgiou et al. (U.S. Patent 5,348,867 – IDS filed on 1-22-99) is withdrawn in light of the amendment thereto.

### *Claim Rejections Maintained*

### *35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The rejection of claims 1, 3-6, 9, 21-22 and 25-27 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement is maintained for reasons of record. The cancellation of claims 7-8 has rendered the rejection of those claims moot. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

**Applicant argues:**

1. The instant claims do not encompass limitless combinations of transmembrane fusion proteins as they only encompass transmembrane fusion proteins in which binding of a ligand to the extracellular domain converts the intracellular domain to an active form.
2. The instant claims are limited to the recited types of intracellular domains which were well known to activate a transducer protein.
3. The specification does not need to re-describe what is well known.

Applicant's arguments have been fully considered and deemed non-persuasive.

With regard to Points 1-3, while the components of the instant invention may have been known in the art, the compatibility of said components which give rise to a functional biodetector was not. The instant claims encompass biodetectors comprising limitless combinations of transmembrane fusion proteins (comprising an extracellular ligand binding domain [i.e. antibody] and a membrane intracellular enzymatic signal domain), transducers and reporter genes/operons. As disclosed in the specification, one must empirically determine which combination of components function as intended (see pages 26-28 of the specification). Given the lack of guidance within the specification, the skilled artisan would not know what combination of elements would produce a biodetector that functions

as claimed. Applicant is reminded that adequate written description requires more than a mere statement that it is part of the invention and *reference to a potential method for isolating it*. The functional fusion protein itself is required. See Fiers v. Revel, 25 USPQ2d 1601, 1606 (CAFC 1993) and Amgen Inc. V. Chugai Pharmaceutical Co. Ltd., 18 USPQ2d 1016.

As outlined previously, the instant claims are drawn to a biodetector comprising a transmembrane fusion protein comprising an extracellular ligand-specific moiety comprising an antibody and a membrane intracellular enzymatic signal-transforming domain (i.e. signal-converting element); a transducer and a responsive element (transcription activation element) optionally coupled to a reporter gene (luciferase) via said responsive element. Said biodetector may further comprise a bacterial cell.

The specification discloses a biodetector comprising a fusion protein consisting of an antibody heavy chain and an active domain of PhoQ, PhoP (signal transducer) and the *lux* operon coupled to the Pho promoter. This biodetector meets the written description provision of 35 USC 112, first paragraph. However, the aforementioned claims are directed to encompass biodetectors comprising limitless combinations of transmembrane fusion proteins (comprising an extracellular antibody domain and an intracellular enzymatic signal domain), transducers and reporter genes/operons. None of these biodetectors meet the written description provision of 35 USC 112, first paragraph. The specification provides insufficient written description to support the genus encompassed by the claim. The transmembrane fusion protein of the claimed biodetector must be able to activate a given transducer via its intracellular enzymatic signal transforming domain upon the binding of the "ligand" to the extracellular antibody. The transducers must be able to trigger either directly or indirectly, the activation of a transcription activating element (promoter) to effect the activation of the responsive element (reporter gene

or operon). The Specification discloses that said transducer may be any molecule that can recognize and respond to a change in conformation, electrical charge, addition or subtraction of any chemical subgroup and is capable of triggering a detectable response (see page 16 of the specification). With the exception of the antibody/PhoQ based biodetector which utilizes PhoP as its transducer and the Pho promoter coupled to the *lux* operon as its responsive element, the specification is silent with regard to what specific combinations of transmembrane proteins, transducers and responsive elements would result in a functional biodetector.

Vas-Cath Inc. v. Mahurkar, 19 USPQ2d 1111, makes clear that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention.* The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed."* (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See Vas-Cath at page 1116.)

With the exception of the aforementioned antibody/PhoQ based biodetector, the skilled artisan cannot envision the detailed chemical structure of the encompassed polynucleotides and/or proteins, regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it. The nucleic acid itself is required. See Fiers v. Revel, 25 USPQ2d 1601, 1606 (CAFC 1993) and Amgen Inc. V. Chugai Pharmaceutical Co. Ltd., 18 USPQ2d 1016. In Fiddes v. Baird, 30 USPQ2d 1481, 1483, claims directed to mammalian FGF's were found unpatentable due to lack of written description for the broad class. The specification provided only the bovine sequence.

Finally, University of California v. Eli Lilly and Co., 43 USPQ2d 1398, 1404. 1405 held that:
...To fulfill the written description requirement, a patent specification must describe an invention and does so in sufficient detail that one skilled in the art can clearly conclude that "the inventor invented the claimed invention." *Lockwood v. American Airlines Inc. ,* 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966

(1997); *In re Gosteli* , 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989) (" [T]he description must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed."). Thus, an applicant complies with the written description requirement "by describing the invention, with all its claimed limitations, not that which makes it obvious," and by using "such descriptive means as words, structures, figures, diagrams, formulas, etc., that set forth the claimed invention." *Lockwood,* 107 F.3d at 1572, 41 USPQ2datl966.
An adequate written description of a DNA, such as the cDNA of the recombinant plasmids and microorganisms of the '525 patent, "requires a precise definition, such as by structure, formula, chemical name, or physical properties," not a mere wish or plan for obtaining the claimed chemical invention. *Fiers v. Revel,* 984 F.2d 1164, 1171, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993). Accordingly, "an adequate written description of a DNA requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it; what is required is a description of the DNA itself." Id. at 1170, 25 USPQ2d at 1606.
The name cDNA is not itself a written description of that DNA; it conveys no distinguishing information concerning its identity. While the example provides a process for obtaining human insulin-encoding cDNA, there is no further information in the patent pertaining to that cDNA's relevant structural or physical characteristics; in other words, it thus does not describe human insulin cDNA. Describing a method of preparing a cDNA or even describing the protein that the cDNA encodes, as the example does, does not necessarily describe the cDNA itself. No sequence information indicating which nucleotides constitute human cDNA appears in the patent, as appears for rat cDNA in Example 5 of the patent. Accordingly, the specification does not provide a written description of the invention of claim 5.

Therefore, only aforementioned antibody/PhoQ based biodetector, but not the full breadth of the claims meets the written description provision of 35 USC 112, first paragraph. The species specifically disclosed is not representative of the genus because the genus is highly variant. Applicant is reminded that Vas-Cath makes clear that the written description provision of 35 USC 112 is severable from its enablement provision. (See page 1115.)

***Conclusion***

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT A. ZEMAN whose telephone number is (571)272-0866. The examiner can normally be reached on Monday- Thursday, 7am -5:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Mondesi can be reached on (571) 272-0956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov.

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/Robert A. Zeman/
Primary Examiner, Art Unit 1645
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